

Fab Fabrication

How to get the best scenic fabrication and rockwork

The Top 20

Where are the world's top 20 most popular waterparks?

AV & Animals

How technology is changing experiences at animal attractions





On VR and the importance of collaboration

Martin Palicki, IPM publisher



On a recent trip to China, I was surprised to find three distinct VR experiences available in one small shopping center in the city of Rizhao. It seemed as though mall operators had walked the show floor at the Asian Attractions Expo in Shanghai and said "I'll take one of these, and a few of those, and I'd like to buy this also."

It may be a fad, as some experts have prophesized, but more likely, VR will continue to evolve and improve and become a staple of our entertainment offerings. Which makes one wonder when VR will be coming to waterparks.

There seems to be a "trickle down" effect of ideas and technologies between the various markets in our industry. Actually, to be fair, the information flows in multiple directions. Museums incorporated gamification and now WhiteWater's "Slideboarding" and other game based activities are available in waterparks. Queue management and reservation systems designed for large theme parks are now being applied to waterparks. Multi-level water play structures are informing next generation adventure and dry play versions at theme parks.

It's only a matter of time before VR and AR become more integrated in the waterpark experience. Once challenges of waterproofing are addressed, there could be significant advantages over current implementations. Most body slides are naturally solitary experiences, so the critique of VR being only a private experience wouldn't hold much water (so to speak). Imagine sliding down a volcano in a river of lava. Or journeying along a fast-moving river through a tropical forest.

More important than VR specifics, however, is understanding that the industry as a whole benefits when we learn from one another. Good ideas come from many sources. InPark, in this issue and as always, works to share the lessons learned and inspire future collaboration. We are only one component. Trade shows and events organized by groups such as WWA and IAAPA are critical for engaging with the entire community and sharing knowledge. We look forward to sharing with you in New Orleans (WWA) and Orlando (IAAPA) soon.



Connecting projects through water

Judith Rubin, IPM editor

Three years ago we expanded this issue's focus from waterparks - to waterparks, zoos and aquariums. "All three types of facilities are geared to families. All are providing ever more integrated attractions and environments. And all are making the most of water features... Water provides a universal connection – something all creatures on Earth need for survival, and seek out for play and respite. Waterparks help people fulfill their natural inclination to get in the water to play and relax," (quoting my editorial from InPark issue #54, in 2014).

For his part, Marty wrote, "Water goes with everything. Hotels first realized the benefit of adding an indoor waterpark in 1994, further strengthening the bond between hotels and water leisure..." Fast forward to The Land of Legends, our cover feature. This new luxury integrated resort, the first theme park venture of hospitality developer Rixos is a lavish real-life example. The huge waterpark supplied by Polin is the dominant feature. Water play and water relaxation drive the guest experience - complemented by a dolphinarium and a wildlife park.

Package those elements together – using the best experienced creatives and providers – and you have a universal experience that connects on a basic level with pretty much everyone, of all ages. Integrate the multimedia spectacular and you take it further. The connection goes straight to the emotions without words, without branding, without IP. High quality hospitality, food and retail and excellent customer service are all reasonable to expect from an established name in hospitality.

Waterparks, of course, are not mission-driven institutions. But water play is universal, as is fascination with animals and the natural world. All speak to the guest on a gut level.



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- 6 TEA Presidential transition From Birket to Willrich • by Roberta Perry
- Storm shelter
 Typhoon Texas takes Houston by storm edited by Martin Palicki
- Turkish splash
 Polin waterpark is centerpiece of new Land of Legends resort edited by Judith Rubin
- The softer side of SeaWorld
 Orlando's aquatic park offers more than just rides by Martin Palicki
- Fun with fabrication
 Tips for selecting a theming fabricator by Dan Faupel
- 26 Inflate and elate
 The innovative inflatable waterslides of Freestyle edited by Martin Palicki
- Quality AND quantity

 Meeting the high capacity needs of waterparks in Asia by Kevin Dazey
- A zoo for generation Z

 Animal enrichment drives design by Stacey Ludlum
- What's AV got to do with animal attractions
 Technology creates new opportunities for immersion and interactivity by Joe Kleiman
- This is how Weber ROCKS!
 What makes a happy rock by Carolyn Gaeta McLean
- Dolphins on the go
 National Aquarium relocation of dolphins is facility expansion on the greatest of scales by Joe Kleiman
- Facts & Figures
 Waterpark attendance numbers from the 2015 TEA / AECOM Theme Index

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advertiser index

Alcorn McBride	21	nWave	2-3
Christie Digital	9	Polin	back cover
DNP	19	ProSlide	31
Freestyyle Slides	8	Wärtsilä FUNA	18
IAAPA Attractions Expo	41	WhiteWater	35
JBA Artistic Engineering	47	WWA	39

COVER: The Land of Legends features water attractions from Polin Waterparks alongside massive theming elements. **Full story on p 12.**

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TEA presidential transition

From Birket to Willrich

interviews by TEA past president Roberta Perry, ETI

These are exciting times for the Themed Entertainment Association (TEA), as our organization approaches its 25th year anniversary in November. At that time - during the annual TEA Members Meeting at the 2016 IAAPA Attractions Expo in Orlando - we will also see David Willrich of DJ Willrich Ltd. become the new TEA International Board President. After two years in the top spot, Steve Birket of Birket Engineering will become Immediate Past President.

Now more than 1,500 members strong, TEA serves the creative, technical and vendor community within the themed entertainment industry. But TEA could not be where it is today without its members volunteering their time, expertise and resources. We have been very fortunate to have had the best and brightest of our industry step up over the years to join TEA leadership, serving as International Presidents and on the International and Divisional Boards (as well as many other roles on committees, conferences, special events and more).

I speak from experience when I say that being part of TEA leadership is a lot of work - but it is also fun and rewarding. I was a founding TEA member and have been immersed in its growth since day one, in a variety of roles including Past President, TEA Summit Co-Chair and member of the Thea Awards Nominating Committee.

TEA's legacy of global leadership continues to expand. It was a unique pleasure to interview Birket and Willrich about their thoughts on the TEA presidency, their new roles, and the future of themed entertainment. I want to thank them both publicly here for their leadership, their time, and their dedication to the Association that has shaped our industry for the last quarter of a century. – R.P.

Note: Pat MacKay, another longtime TEA member and Co-Chair of the annual TEA Summit Case Studies Day (with Roberta Perry) provided editorial assistance on this article. The next TEA Summit is April 20-21, 2017 at Disneyland Resort in Anaheim.



When did you join the Themed Entertainment Association (TEA)?

Steve Birket: Birket Engineering joined in the early '90s, when the Disney-MGM Studios and Universal Studios Florida had just come out of the ground. I remember sitting in our office in Orlando and getting a call from TEA's second president Joe McHugh. He was looking for contacts for potential TEA members. We had two parks' worth of business contacts, and so it was an easy request to satisfy.

David Willrich: DJ Willrich joined in 1996 when word of the TEA reached Europe at one of the TiLE conferences.

Why did you feel it was important to join?

Birket: It was and is the only industry we were a part of, and everybody we knew were members.

Willrich: We noticed that leading competitors in the attractions field, who also overlapped into museums as we do, were joining so we felt we needed to find out what the new "club" was all about!

Tell us about your past involvement with the TEA.

Birket: I was a member of the TEA Eastern North American Division Board when I missed one of the monthly calls. On the next call they told me, "By the way, you are now the Board Secretary." I remained in that role for two years, then served as Division President for two years. Following that I served six years on the International Board – during which time I co-chaired the Technology segment of TEA's annual SATE conference on Experience Design, helped kick off the TEA Asia Pacific Division, served on the Executive Committee, and acted as Board Treasurer.



Willrich: I was elected to the TEA Europe & Middle East Division Board (EME) in 2008. I became EME Division President in 2013 and served for two years, then was elected to the International Board in 2015.

Steve, what were your goals when you began your term as TEA president?

Birket: Not a small part of the original motivation to create TEA was to create a business voice for the membership. I very much wanted to see some of the original intent of the Association be brought into better focus, and to see a more balanced technology component in our educational offerings.

Dave, what are your goals as incoming TEA President?

Willrich: To continue to develop our SATE brand! I would love to continue to raise the profile of our SATE conference and SATE Academy Days – to have it recognized as major thought leadership.

Also there are initiatives already started by Steve in the mix which I am keen to see come to fruition.

I would like to explore steps that further establish the TEA brand as synonymous with quality and integrity in the industry. This would be huge for TEA members and the association.

Steve, what accomplishments in your term make you most proud?

Birket: I am very pleased to see many of our industry's largest owner/operators, and other groups from outside our industry seek out TEA. Today, the world wants TEA. It wants our acknowledgement, our voice, our content, our expertise, our people. Over and over again during my term we have provided a voice to the world press, content to university audiences,

and have been sought out by leading global developers and operators. It has been a great time to be President of the TEA.

TEA has arrived in the mainstream press, thanks to industry growth and other factors - and we've stepped up to meet the interest. I joke that being the TEA President has influenced my wardrobe decisions. I must always be ready for an in-person or phone interview.

I'm also pleased that we've used social media effectively to expand our reach and position. One example is the great and expanding collection of TEA event videos and webcasts available on our TEATV channel [accessible through teaconnect.org].

What do you see as important areas of growth and progress in business and markets?

Birket: The notion of 'themed entertainment' no longer conjures up an image of just a ride or show. Our industry touches boardrooms, hospitals, retail, military simulations, live events, visitor centers, water parks; the list goes on and on. This diversifying of markets will continue. And as the industry grows, so do TEA membership and membership offerings. We continue to see great expansion in Asia.

Willrich: TEA membership benefits - in particular the range of activities we provide - have grown in quality and strength considerably over the last few years, helping our growth in all regions. Of course I want to see continued growth - but solid growth for all the right reasons - i.e. members see the benefits that we have to offer and are fully engaged with the TEA. I would add that our focus should always be on quality, not quantity - to ensure we really do represent the best in the industry.

What are your thoughts about engaging our owners and operators?

Birket: More and more, owner/operators are eager to engage with TEA to exchange ideas and promote the industry and the vendor community. This is a win-win that helps take us all forward to a better industry, better projects and better business.

Willrich: I am keen that we do not forget owners and operators and we continue to attract them as (ideally) proactive members of the TEA. We have had some growth in numbers in the EME Division who have in turn been excellent hosts to our events!

Tell us about how TEA events such as the Thea Awards, TEA Summit and SATE conference have helped set important standards for our industry.

Birket: The importance of the Thea Awards is enormous and international. When I travel I am always humbled to see a

recipient's Thea Award in the most prominent location of their facility. TEA awards the best of the best, and the industry knows it. The SATE and Summit conferences set the bar to which other industry organizations look. It is a great honor and a continuing challenge.

Willrich: Thea Awards and SATE are our two biggest brands and something to be really proud of as in both cases they do stand for quality and very much encompass our industry and are therefore, hugely important. Becoming a Thea Award recipient really does mean something - the level and quality of entries every year are testimony to this.

What would you like to say to the members as TEA prepares to celebrate its 25th anniversary?

Birket: TEA is built on relationships. It is built on relationships with members, owners, operators, sponsors, institutions, and trade groups. These are our greatest assets. The professionalism and creativity of our members will take us forward the next 25 years. And with David Willrich as incoming President - I can't wait.

Willrich: To TEA members I say: Please step up, and speak up! We need to know that what we are doing is right for our membership, and we need you to volunteer so that we can keep building a great association and industry.

To themed entertainment professionals who haven't yet joined TEA, I say: Sign up!

To Steve: I look forward to working with you and will be making the most of your availability as Immediate Past President. • • •



Roberta Perry



Pat MacKayOnes&ZerosMedia

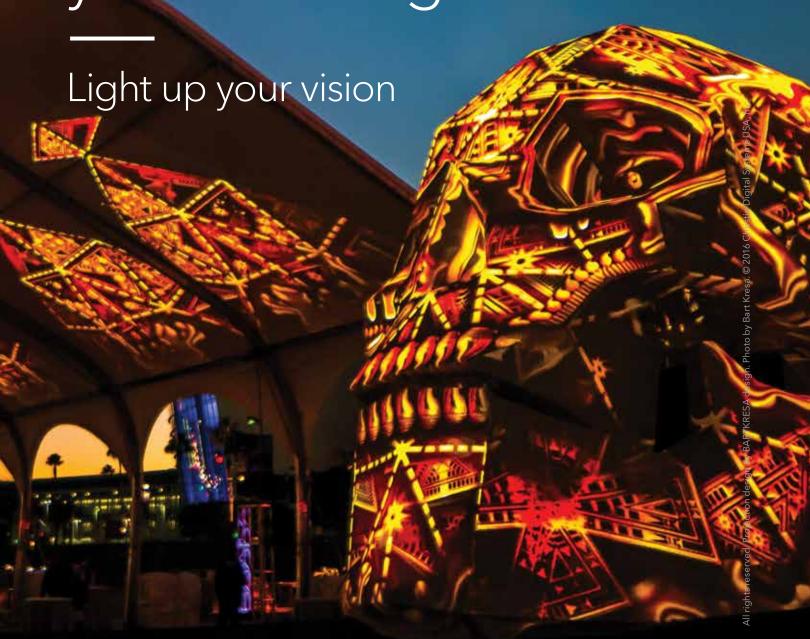
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Storm shelter

Typhoon Texas takes Houston by storm edited by Martin Palicki

pened in May, Typhoon Texas is one of the few privately funded waterparks to launch in the United States in the last 10 years. The 43-acre park in Katy, Texas was developed by three Texas A&M University alumni: Keith Dalton, Terry Hlavinka and Ray DeLaughter. The friends had worked together on previous projects and felt there was a need for more entertainment options in the Houston metro area. The park debuted with nine water attractions and a 25,000-square-foot wave pool. WhiteWater West provided waterslides, a wave generator and children's interactive play structure for the park.

The park also offers unique experiences such as the Splash Cinema - a Thursday evening movie night within the park - and weekly summer camps that entertain kids with games, crafts and ecological experiments. Typhoon Texas also offers quality food and beverage selections such as smoked brisket, served at its Southern-inspired restaurant.



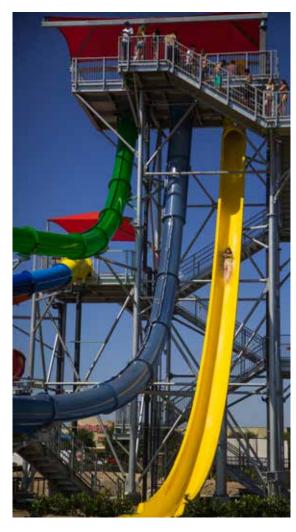
Since the 2008 recession, privately funded large waterparks have been almost exclusive to booming overseas markets such as China, Southeast Asia and the Middle East. That trend may be changing. With an improving global economy, Typhoon Texas could indicate a resurgence in the North American market, particularly from private investors. "We see funding models becoming more diverse, and Typhoon Texas is at the front end of a trend," says WhiteWater Marketing Director Una DeBoer.

"Building a brand new waterpark from scratch was a huge undertaking. We knew if we were going to build a new waterpark in Texas it had to be big and it had to open on time. We needed a partner with the horsepower to get it done and WhiteWater was the right decision," says Keith A. Dalton, Co-President, Typhoon Texas.

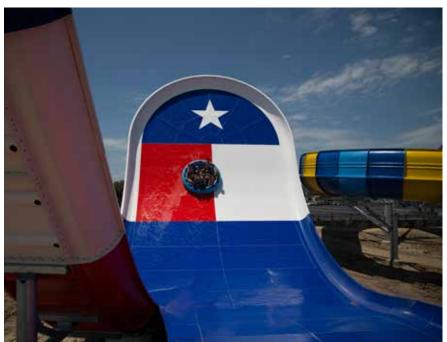




Owners Keith Dalton (pictured) and Terry Hlavinka had built a Goya Foods plant years ago and wanted to develop another joint venture, with a focus on family fun. Dalton had done construction work in Orlando for Disney and Universal years ago and saw a void in the Western Houston metro market. DeLaughter brought CFO skills to the group and provided initial business planning forecasting for the project.



"Working with Keith, Terry and Ray has been inspiring as their dedication to the project can be seen through every step we take with them. They're pushing the boundaries in delivering unique experiences to their guests matched by a passion to offer exceptional customer service," says Scott Haycock, VP Business Development, WhiteWater.



All photos courtesy of WhiteWater

The Texan waterpark shows its patriotism with the Texas flag displayed proudly on the Boomerango wall of the Texas Twister. Also debuting at Typhoon Texas Waterpark is North America's first Fusion AquaSphere + Constrictor waterslide ("The Typhoon") which is equipped with six-person rafts for added capacity. "When you're inside The Typhoon, it's absolutely amazing and so much wilder and enormous than you expect. This monster slide is creating screams and smiles on the faces of our guests here at Typhoon Texas," says Steve Mayer, Typhoon Texas Director of Marketing. •••



Turkish splash

Polin waterpark is centerpiece of new Land of Legends resort

edited by Judith Rubin

Aluxurious, giant wave pool supplied by Polin Waterparks is central to The Land of Legends theme park and destination resort, open since July 1 in Antalya, Turkey. The wave pool surges at the heart of the facility and its key offering: a 280,000-squaremeter waterpark supplied by Polin. The extensive waterpark establishes the property as a realm of lakes, pools, rivers, beaches, palaces - and monumental waterslides. Within this unique, world class integrated resort guests will also find a dolphinarium, a wildlife park, custom dining and retail offerings, a five-star hotel, and more. Rixos World Parks & Entertainment rolled out this first phase of The Land of Legends with development partners Emaar Properties PJSC and Dragone Productions.

The Daily Sabah travel section reported: "The most impressive section of The Land of Legends is the aqua park. Especially the artificial beach, which makes you feel like you are in the Caribbean, and the tide pool, both are wonderful... the man-made beach features white sands and artificial monsoons, allowing rain to pour down on you suddenly and without warning. Giant slides are also a source of fun and entertainment for families. The giant park does not end there. In the tide pool you can learn surfing, and there is also a 5-D cinema, a roller coaster which reaches a

height of 40 meters, a zoo featuring South African penguins and water tigers - all in the same facility..."

Rixos is best known for Rixos Hotels, a provider of luxury hospitality with numerous properties in the EMEA region, and this project signifies the company's venture into full scale entertainment development. Emaar Properties is a publicly held real estate firm company with competencies in hospitality, leisure and retail. Its iconic assets in Dubai include the Burj Khalifa, The Dubai Mall and the Dubai Fountain. Entertainment legend Dragone Productions, under founder and art director Franco Dragone, has been organizing shows, water-themed theatrical shows in particular, for over 100 million people in Las Vegas, Macau, Paris, Wuhan, Dubai and Russia.

The issue of current events in Turkey cannot be ignored. As stated in the Aug 18 edition of The National, although Antalya is a visitor hotspot, the opening of The Land of Legends "...comes amid a particularly testing period for tourism companies in the country." The article notes that tourism to the region has dropped significantly in recent months but that operators "...are hoping that the numbers will soon recover. And, an increasing number

of businesses in the country seem to think they will, along with a rebound in the wider economy... Rixos remains undeterred."

In a June 15 press conference, Rixos Hotels Chairman Fettah Tahmince said, "In addition to its construction, the investment in technology, performances, stages and visual art design plays an important part in the project, and nearly 50 percent of the total investment comes from equity capital. The aim of the project, which will bring new color into Antalya's rich product diversity, is to be one of the first entertainment and holiday choices of approximately 3 billion people living in the region covering Turkey and its surroundings."

Getting back to the waterpark, Sohret Pakis of Polin Waterparks said, "The sheer size of the waterpark proves its starring role. But it's not just the dimensions; it's the sheer number and variety of attractions: 72 slides plus many additional aquatic attractions."

Dr. Kubilay Alpdogan, Director of Sales and Design, Polin Waterparks, said, "It's truly our 'project of the year.' This project is unique to the EMEA (Europe, Middle East and Africa) region of the world. It was a huge project - and one of which we are immensely proud."

Land of Legends facts

- Opening date: July 1, 2016 (first phase)
- Developers: Rixos World Parks & Entertainment, Emaar Properties PJSC, Dragone Productions
- Location: Belek district of Antalya, Turkey
- Budget: US \$1B (first phase)
- Timeline to opening: 30 months (first phase)
- Area: 639,000 square meters
- Master planning, concept & schematic design: Jack Rouse Associates
- Waterpark supplier: Polin Waterparks

- Waterpark size: 280,000 square meters
- Wildlife park size: 146,000-square-meters
- Shopping boulevard size: 196,000-square-meters
- Hospitality: 17,000-square-meter, 5-star hotel
- Observation tower: 111 meters high
- Theme: Roman Empire/Greek Poseidon
- Project rollout: three phases (first phase complete)
- Projected completion: 2018 (all phases)
- Projected total investment: TL 4 billion
- Employment: 1,000 people (first phase)
- Total projected employment: 4,000 people

Land of Legends – Role of Polin Waterparks

Deliverables & scope of work

• Development/design

- Consulting
- Water playground
- Spray zone
- Wave and river systems
- SurfStream®
- Wave Ball
- Full hydromechanical sytem, including water circulation and filtration
- All waterslides, rafts/tubes/mats
- FEC equipment
- Kids' interactive play structures
- Other children's equipment





Waterslides

- The Magicone. Shaped like a giant funnel on its side; guests slide down a steep drop that sends them whirling around the conical interior. The Land of Legends is the only facility to feature this slide to date.
- Family Rafting Slide. Guests of all ages ride together in six- or eight-passenger rafts.
- **Windigo.** Guests enter alongside one another in enclosed tubes that spread out to create geometrical curves that curl parallel with the others and end in multiracer lanes.
- **Kamikaze.** Engineered to deliver high-speed thrills, this free-fall high slide features a curvy path that sweeps guests through several adrenaline-pumping drops.
- Freefall. An exhilarating drop for guests who want to experience the thrill of a freefall without the danger.
- Looping Rocket. This attraction features a unique "launch capsule" 73 feet in the air with a trap door that opens to send riders through a high-speed, horizontal, 360-degree loop.
- **Spaceboat.** This extreme raft slide is said to be one of the most popular bowl rides of the industry. Guests begin a high-speed, enclosed tube ride through a swirling vortex before they are discharged into a huge, open bowl.
- **Space Shuttles.** These extreme-themed waterslides shoot guests through tubes into a space-shuttle-shaped pod. Thrusting sprays of water slow the ride, shooting riders side-to-side before expelling them downhill.
- Black Hole. One of Polin's most popular rides, this tube

slide provides high-speed travel through multiple turns and inclines with the extra adrenaline enhancement of Polin's patented Natural Light Effects technology.

- A Navigatour + Rafting Slide + Black Hole Combo Waterslide. A unique design specially engineered for the Land of Legends, the ride has set a record for being the longest watercoaster in the region with a triple uphill shoot.
- The Compact Slide. This slide's compressed design features special angles and radius components to fit into even the smallest spaces.
- Multi Slide. Designed to allow parks of any size to accommodate guests on mats or without, this ride features lanes aligned side-by-side with guests racing adjacently over multiple hills and drops and exiting into either a pool or run-out.
- Black Hole + Rafting Slide Multislide Combo Waterslide. Another unique combo design that was specially created for this park, this fusion of several of Polin's top attractions allows multiple riders to experience a thrilling, adrenaline-filled ride.
- Navigatour Uphill + Rafting Slide + Black Hole
 Multislide Combo Waterslide. The unique slide paths of
 this attraction created specially for The Land of Legends
 - have never before been combined. The ride incorporates
 a specially engineered uphill section with both rafting and
 tunnel slides.
- Lazy-Crazy River. Another of the aquatic attractions created specifically for this park, this ride is designed primarily as a crazy river - covering about 80 percent of the length of the river - with the remainder of the ride



a relaxing lazy river, allowing guests to relax and float leisurely.

Children's attractions

- **Kids' Wide Slides.** Scaled down version of Polin's classic Wide Slide.
- **Kids' Freefall.** Scaled down version of the Freefall offers a thrilling drop suited to the younger set.
- An Octopus Slide. This colorful attraction features six arms of stairs and slides with a giant octopus head that rains droplets of water.
- Frog Slide. This slide lets children slide out of its mouth along its tongue.
- Baby Octopus Slide. A bright, colorful toddler slide.
- **Dolphin Fountain.** This interactive option squirts an arcing stream of water.
- A Mushroom. Colorful fountain.
- A Mini Pirate Slide. This interactive play center includes numerous waterslides.
- Water Play Structure (C12 version). Reaching more than 13 meters high, this multilevel structure has a sand and seashell theme and features 100+ interactive features, including five waterfall jets, 15 water guns and 13 tippy buckets. This massive attraction is said to be the biggest water playground in the EMEA region.

Ladies-only area, for female guests and their children

- **The Body Slide.** This versatile slide requires no mats and offers a variety of design options and slide paths for varying speed levels and a mix of drops and straightaways.
- **Tunnel Freefall.** This body slide delivers an exhilarating drop, combining adventure with adrenaline.
- **Kamikaze.** Engineered to deliver high-speed thrills, this free-fall, 88.58-feet- (27-meter-) high slide features a curving, 315-foot- (96-meter-) long path that sweeps guests through several adrenaline-pumping drops.
- **Twister Racer.** This four-lane, multi slide blends speed with twisting turns as multiple tubes intertwine.
- **Hybrid Racer (Space Boat + Turbolance Combination).** This combo merges racing slides with the Black Hole's enclosed tube slide to send guests into a whirling open bowl before speeding uphill on a steep vertical slope, then backward on a reverse path over a bump and into a splash pool.
- Black Hole + Flying Boats Combination. This combo shoots riders along a high-speed, special-effects-fueled ride with additional rushes up-and-down before a final downhill and unexpected drop.
- Family Rafting Slide. Billed as the first RTM-manufactured [Resin Transfer Molding] family slide in the industry, it allows guests of all ages to ride together in a six- or eight-passenger raft.









- The Wave Ball: Created by the WOW Company (Belgium), this attraction sits in the center of a pool and uses powerful software and hardware to control the frequency and size of the pool's waves. The size of this installation is a first in Turkey and it has been one of the park's top attractions since its installation. Designed by Polin in collaboration with WOW engineers to create a pool that resembles a typical wavepool shape.
- Water-Play Structure (B6 type). This smaller version of the park's main water-play structure reaches 10.8 meters into the air and features 53 different interactive elements.
- Lazy River. Relaxation is the focus of this leisurely ride.

Proprietary to Polin

At The Land of Legends, all waterslides feature Polin's specially engineered benefits – the Natural Light Effects, Special Pattern Effects and translucency.

All slides were designed and installed by Polin's team of engineering experts and were manufactured using L-Resin Transfer Molding (L-RTM) composites technology. Polin pioneered the advancement and application of this process in waterslide manufacturing. The firm named the technology

Magic Shine because the manufacturing process creates two perfectly shiny sides. As a result, slide components not only are more attractive, but they are also easier to install, as well as stronger and lighter than comparable products due to their uniform thickness and smooth edges.

RTM also allows Polin's slides to feature other unique benefits. Specifically, they include the company's patented Natural Light Effects technology and Special Pattern Effects technology, as well as translucent color options.

Interactivity is also a key feature of Polin's designs that are showcased at the park.

Creative collaborations

Polin and American Wave Machines of San Diego, CA joined forces to produce a unique SurfStream attraction for The Land of Legends. It is said to be the region's first SurfStream, as well as the world's first standing wave-surfing machine, allowing riders to use real surfboards and surf an endless wave. This unique SurfStream features a double surf-system configuration that allows the operator to run each side separately to feature a range of wave sizes. That option allows one side of the ride to

offer an advanced barrel wave while the other side can feature a wave perfect for family bodyboarding. Six surfers and 12 bodyboarders can use the attraction at the same time.

Other creative collaborators brought in by Polin were WOW company and Kraftwerk Living Technologies.

Polin Waterparks

Polin was founded in Istanbul in 1976 and has since grown into a leading company in the waterparks industry. Today Polin is a world leader in the design, production and installation of waterparks, waterslides and water-play attractions. Polin has completed 2,500 waterpark projects in 100 countries around the world and is the biggest waterslide supplier in Eurasia. Working with a wide variety of clients has helped Polin reach several milestones including installing the first waterparks in many countries and many other award-winning rides at parks with world-renowned reputations.

Polin's wide range of product offerings includes signature rides such as the patented King Cobra, Magic Spheres, Spheres, Magi Cone and Space Shuttle.

Polin is the pioneer in the advancement and application of closed-molded manufacturing technology in waterslide development. First implemented in 2006, 100 percent of Polin's annual fiberglass production has been converted to resin transfer molding (RTM) and meets the industry's highest standards. Polin offers both bowl rides and family rides featuring RTM techniques.

Polin has been an ISO9001 certificate holder by TUV Germany since 2003, and all Polin slides conform to European norms. All steel parts conform to international DIN standards, all designs conform to ASTM practices, and Polin is also CSEI-approved for projects in China. Polin holds a quality certificate for all of its waterslides by TUV and was the 2012 Export Winner of Turkey in the SMSE Category.

Polin oversees a high-capacity design-and-manufacturing facility in Turkey with a team that totals 500 people with five offices throughout the world. •••





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The softer side of SeaWorld

Orlando's aquatic park offers more than just rides

by Martin Palicki

A mid the buzz and excitement over Mako, the new, shark-themed roller coaster at SeaWorld Orlando, the park continues to promote its message of conservation through the SeaWorld Cares program. While on site for the Mako opening, InPark explored three other experiences in the park that may not be making headlines, but are making a difference in the world of conservation.

Antarctica: Empire of the Penguin

SeaWorld's popular Antarctica family dark ride (profiled in InPark #48 Technology 2013) continues to engage guests and introduce them to the world of penguins. The real stars, of course, remain the park's collection of penguins featured at the ride's finale. And guest interaction with penguins doesn't have to end there.

For an additional fee, guests are able to sign up for a behindthe-scenes tour with a trainer to learn more about penguins and their habitat at the park. The experience culminates in a brief interaction with one of the park's resident penguins. The program is similar to other animal encounter programs available at SeaWorld.

Animal Rescue Team

SeaWorld's concern for the well-being of animals extends beyond what is visible to guests. We met with the park's animal rescue team, which becomes involved when the Florida Fish and Wildlife Commission calls saying there is an animal needing rescue (often a manatee, and typically injured by boats or unseasonably cold weather). SeaWorld transports the animal to the park and helps nurse it back to health. The Fish and Wildlife Commission advises SeaWorld when the animal is cleared to be released back into the wild.

SeaWorld carries out this program with a consortium of zoos and aquariums that support animal rescue, rehabilitation and release. Although the park does receive some reimbursement from the state for this service to wildlife, the majority of the program's costs are covered by park admissions. It's not something the average guest may be aware of, but their visit to SeaWorld helps fund a critical animal rescue service. How many parks can boast that?

Shark Wreck Reef

The new Mako roller coaster offers plenty of hard thrills and excitement but it doesn't stand alone. The ride is the centerpiece

of an entire area revitalization – a realm of the sharks with much to see, do and think about. SeaWorld's existing shark encounter attraction, which lets guests pass beneath the park's giant shark tank and watch the graceful creatures swim overhead – was refreshed with a new look inspired by shipwrecks and the ocean itself. Weathered pieces of wood alongside stamped metal cutouts of sealife decorate the new Shark Wreck Reef. The area includes three interpretive zones, as well as retail and food & beverage facilities. The cohesive, themed zone encourages guests to stay longer and learn more about sharks and their habitat.

Of particular note is the park's partnership with Washed Ashore, a nonprofit that collects trash from beaches and creates sculptures for cultural institutions. The park commissioned a Mako shark sculpture from the group, which SeaWorld has affectionately named "Finn." When not on display at the park, Finn may be on a road trip to various schools and events around the country, acting as an ambassador for the park's educational and conservation outreach.

One thing was abundantly clear: all the staff we encountered are working at SeaWorld because they love the animals they care for and see great value in being able to teach guests about the importance of conservation and environmental awareness. •••



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Fun with fabrication

Tips for selecting a theming fabricator

by Dan Faupel, VP, Creative Visions

The physical themed environments in theme parks, museums, zoos, family entertainment centers, exhibits, aquariums and other visitor attractions are the product of multiple skills and disciplines. They include concept design, structural design, sculpting, digital sculpting, mold making, casting, 3D scanning, 3D printing, CNC foam carving, wood work, metal machining, welding, hard coating, fiberglass work, and painting.

I have found that there are typically multiple techniques that can be utilized through the fabrication process to achieve the desired results. Experienced fabricators will know which techniques are going to be the most efficient and effective for the project at hand.

A good themed environment will help tell the story of your attraction. It begins with good design. Rick Bohler, President and Art Director of Pizzazz Scenic Contractors said, "Theming can be an expression of a personal point of view and it's not necessarily right or wrong but individual, so having a good design from the start is crucial."

Optimally, your amusement attraction is growing, with new features being added and new needs popping up constantly. You might be adding a new mini-golf course, a new ride, a live animal exhibit, or an interactive attraction. All of these and more become much more immersive and cohesive with creative theming.

Time is money

In this article I share my own experiences from 20+ years of working in themed attractions. I also pick the brains of several industry colleagues – including fabricators and attraction operators - to help you understand the complicated process and select the right provider. Following these guidelines will maximize your chances of a good process and a good end result.

Trying to save resources and money? Keep in mind that the shorter the production timeline, the more your project is likely





Top: Author Dan Faupel puts finishing touches on a creature at Creative Visions *Photo courtesy of Creative Visions* **Bottom:** Sparks fly at Cinnabar while creating set pieces for a new museum exhibit *Photo courtesy of Cinnabar*



to cost. On the other hand, the more lead time on your end for planning and approvals, the more time the fabricator has to focus on your project. A fabricator can bid a more favorable price knowing they can fit your project more readily into their schedule. They will have more buying power with their own sources and be able to consolidate your order with others. The luxury of time also enables the fabricator and every member of your creative team to spend more time artistically on your project.

My boss Mark McDonough, president of Creative Visions, said, "Start by looking at the big picture. Make sure your estimated budget is in line with your goals...and make sure there is a realistic amount of time to achieve those goals."

The project team

Factors to consider before going forward with an RFP: who will select the fabricator, who has any favored fabricators and why, who will carry on day-to-day project management, and who will be onsite during the installation. This team will help define the scope of the project as well as help evaluate the proposals that come in. The project team should include everyone with a vested interest and involvement in the vendor selection process. This could include the architect, engineer, interior designer, art director, operations manager, AV integrator, animal behaviorist, exhibit director, accountant, or museum curator.

Robbi Lepre, Director of Theatrical Services at Busch Gardens Tampa, said, "We develop our RFPs in conjunction with the design and technical team and usually a corporate procurement representative. We include as much information on the RFP on our expectations and requirements as possible so the fabricators take that information into consideration in their proposals. This could include engineering or rigging requirements, contractor guidelines for work conducted both on and off our property, safety and environmental requirements, and material specifications."

Documenting all of the project's goals, tasks, deliverables, deadlines and budgets will help immensely when reviewing and comparing vendors. "Prioritize your scope to identify the items that are most important to you," said Bill Criscione, Owner of Ghostly Manor Thrill Center in Sandusky OH. "During negotiations you may need to give a little to find common ground. Knowing your priorities will make it more apparent where you can 'give.' Depending on the scope of the project it may be prudent to get the advice of your attorney. It never hurts to have a second or third set of eyes involved."

Apples-to-apples

Here, we break down the RFP into six parts. First is an organizational overview sharing information about your organization's goals and their focus on the project. Second is the most important component - a detailed set of project specifications. The more detailed and accurate, the better.

Melissa Ruminot, director of marketing & business development for The Nassal Company, a well-known fabricator and producer, said, "We rely a lot on art direction because at the end of the day we are all builders and fabricators. Having a very clear vision and

understanding of what you want the end product to look like from a scenic finish capacity is very important. Knowing what you don't want, and understanding what you DO want - and being able to communicate that effectively - will help ensure that the bids you get are apples-to-apples."

Lepre said, "Our RFPs typically include concept renderings and detailed, scaled drawings along with a proposal outline asking the fabricator to provide a brief explanation of their approach. We also ask for information about their team."

Third, define all technical and administrative requirements your organization has for the fabricator, such as certification or educational background, background checks, and work experience. You can also include details such as completion dates, intellectual property rights, expectations for technical components, billing requirements, and maximum bid price range to bid within. Allow room to negotiate.

Rick Bastrup, President of R&R Creative Amusement Designs said, "Some fabricators have more experience in specific areas such as concrete rock work, fiberglass molding or hard coat foam sculpting. It is wise to make sure you are selecting the right type of fabrication materials and process for your project rather than just going with the suggestions of the bidding company."

"One thing that I think is really important is to really pay attention to who the key personnel are and how long they have been at the firm, said Basil Katz, CEO of Cinnabar, a leading producer and fabricator. "That will tell you something about the culture of the place."

Fourth, request references. Fifth, provide information regarding what proposal evaluation criteria will be implemented and the evaluation timeline. Ask the people on your project team for any particular criteria they want included and communicate this to the vendor upfront. Allow for the possibility that in the course of dialog with various fabricators you may learn something that requires changing part of the RFP.

Time is still money

Sticking with a set process shows bidders that you know what you are doing. Fabricators typically spend non-billable time on creating proposals, so whatever you can do to streamline things will help build a good relationship.

A timeline for reviewing fabricators should be factored into your overall project timeline, down to the week and day, and communicated to the entire project team. Criscione said, "Start with knowing what you have for a budget and the timeline needed for completion. The timeline may include the negotiation process on large projects. You don't want to be forced into a decision solely because of time constraints."

The sixth and final section covers proposal delivery criteria and contact info. Let bidders know who they should contact and how. Include proposal submission and formatting guidelines, minimum content required and deadlines.

John Wood (left) shows off props and animatronics pieces Sally fabricated for the Justice League attraction to Six Flags management. *Photo courtesy of Sally Corporation*





Dan Faupel poses atop his 28' giant dragon, made at Creative Visions for FantasyCon. Made of fiberglass, steel and aluminum, the dragon breaks down into 11 pieces for shipping and reassembly. *Photo courtesy of Creative Visions*

Making a good match

Ideally your short list should have three to six candidates. A diligent process should lead you to a solid, primary choice of fabricator for the project. Select an alternative as backup in case negotiations go awry.

John Wood, Chairman and CEO of Sally Corp. said, "I typically start by asking our customer if they have any preferred vendors in the field of scenery or thematic design. If they have a local vendor that they like we will certainly interview them as a possible candidate. Next, we would look to companies who have a good reputation and a working relationship with our company."

"It is about selecting a partner where you have full trust in their technical ability and with whom you will also have an enjoyable and collaborative working relationship," said Katz. "Have one or two substantive conversations with the potential vendor, and really think about the quality of the exchange, because those are people you would be working with closely."

Bohler said, "A good theming contractor should quickly explain their procedures and expected hidden fees or possible change orders on your project. They should have in-depth knowledge of fire marshal concerns, life safety concerns, depth in structural and engineering needs, as well as being able to explain the different materials that they are using and why."

Cristina Heredia, Exhibits Manager at Zoo Miami, said, "It's a nobrainer to look at a particular company's past work, pricing and references but an often overlooked but equally important piece is building a relationship. A good working relationship supports a certain level of collaboration, trust and flexibility for both vendor and client. This leads to opportunities for more work for the vendor and often times a better product for the client since the lines of communication are always open and both parties feel good about being honest and working towards a common goal."

There's just as much art and craft to the selection process as there is to fabrication itself.

"Both parties need to feel good about the deal and see the relationship as a partnership," said Criscione.

"Too often, good projects go bad because of lack of initial planning," said McDonough. "You are essentially creating a business plan for your project, and by working through the details, you greatly increase the chance of a smooth and successful project." •••

Inflate and elate

The innovative inflatable waterslides of FreeStyle edited by Martin Palicki

reeStyle Slides® is a supplier of inflatable water slides offered since 2002 as an alternative to permanent water slides, and positioned to compete in the theme park and waterpark sectors. The inflatable slides are on a comparable scale to theme park attractions but considered to be temporary structures. This has enabled the company to penetrate non-traditional markets such as campgrounds, zoos, and beach resorts in addition to serving private customers. Here are some FreeStyle Slides "greatest hits."



Hippo: The Slide That Started It All

FreeStyle Slides® installed the Hippo® at TradeWinds Island Resorts in St. Pete Beach, Florida in 2002 and an industry niche was born. Fourteen years have passed and the mutually-beneficial partnership between FreeStyle Slides and TradeWinds is still going strong.

Cruiser: An Industry First

FreeStyle Slides created its first sealed air inflatable yacht slide in 2008 for the Motor Yacht Lazy Z. Since then, the FreeStyle Cruiser® yacht slide has become a must-have yacht toy. FreeStyle Slides continues to develop its line of bespoke inflatable products in the industry.



A Hybrid of Land and Sea

The engineering team at FreeStyle Slides never backs down from a challenge, especially when it comes as a request from a member of Monaco's royal family. Combining elements of its land slide with its Cruiser yacht slide resulted in the first Hybrid® slide. This landmark slide was installed on the third story deck of the Yacht Club de Monaco in 2014. Riders slide 15 meters down before plunging into the Mediterranean. FreeStyle Slides custom Hybrids can launch from scaffolding or an existing structure and run into a slide landing bed or a body of water.



Trippo: Triple the Fun

The FreeStyle Trippo® was created in 2012 after the Tradewinds Island Resort requested a slide that would top their Hippo. The first Trippo stood 36' tall – the same height as the original Hippo – but featured three slide paths, resulting in a novel, 3-lane inflatable waterslide. The TrippoXL (pictured left) made its debut in 2016 in Australia measuring a whopping 50' tall.

HybridXL: Almost Sky-High

FreeStyle Slides created a soaring 73-foot+ tall HybridXL for a private customer in Perth, Australia. "The Drop" was named the world's tallest inflatable water slide by the Guinness Book of World Records. Thrill seekers can ride The Drop at Splash City Perth in the near future.



Innovative Partnerships

In addition to designing and manufacturing their own products, the team at FreeStyle Slides is often called upon to produce inflatable products on behalf of other companies. We were honored to collaborate with industry leader WhiteWater West in 2012 to produce inflatable versions of their FlowRider and WaveOz simulated surfing systems. Slide to Safety also partnered with FreeStyle Slides to produce a Rapid Evacuation Slide that provides an alternative method of evacuation from multi-story buildings in the event of dangerous situations. "Our engineering team enjoys the challenge of creating solutions for our partner companies," says FreeStyle Slides CEO, Stephen Philp. • • •



All photos courtesy of FreeStyle Slides



This family 6 Raft Ride at Typhoon Texas, a fully WhiteWater park, helped them exceeded all their attendance targets for their opening 2016 season.

Photo courtesy of WhiteWater

Meeting the high capacity needs of waterparks in Asia by Kevin Dazey

As InPark recently reported in our 2016 Asian Attractions Expo roundup [issue #63], the needs of the booming Asian themed entertainment markets are driving a trend toward mega-capacity in waterparks. We pursued this topic further and asked several vendors about what they and waterparks can do to accommodate a higher throughput: Empex Watertoys, ProSlide Technology, and WhiteWater West Industries.

Finding the sweet spot of serving visitors on peak and non-peak days is one of the challenges waterparks face. The vendors we spoke to pointed to the need for good park planning, adequate facilities and guest flow design as factors equally as crucial as selecting the right mix of attractions.

Making throughput a top priority - keeping the lines moving - is always a positive thing from the guest's point of view at a waterpark. Waterparks have a unique mix of activities to entertain guests; those with near instant access (pools & structures) and those that serve fewer guests per hour (slides & water coasters).

Based on the 2015 TEA/AECOM Theme Index figures, the most highly attended waterpark resides in China: More than two million visitors attended Chimelong Water Park last year to enjoy its slides, pools, rivers and play areas. While not all waterparks in Asia experienced growth from 2014 to 2015, worldwide

attendance saw an increase. [See 2015 global waterpark stats on page 46.]

What are some significant differences or challenges in providing for Asia's waterparks versus other parts of the world in terms of meeting capacity needs?

Wyeth Tracy, President, Empex Watertoys: Crowds are larger and therefore larger facilities with extensive water feature varieties are needed. It is useful to have a wide range of products to draw upon to create large water playgrounds with a variety of features that serve all age groups.

Dawn Tong, Vice President Business Development China,

WhiteWater: The challenges in meeting high capacity are more related to park design as opposed to supplying the attractions. When designing the park we have to make sure facilities such as restaurants and change rooms can accommodate large numbers of visitors on peak days. We also have to make sure the arrival plaza and the main passage ways are designed to avoid bottlenecks. Of course we have to match the rides program's capacity with the attendance goals, but the attractions themselves are not different from what we provide customers from other parts of the world.

Joe Bevk, Senior Vice President of Sales & Marketing, ProSlide: This is where master planning is really important. A great waterpark master plan will take into account locations with small and large footprints, capacity for volume and demographics, and more importantly the guest experience.

A recent report in the South China Morning Post indicated that the Chinese population does not mind traveling for a destination, especially if it boasts unique selling points. The same report cited theme park destinations as accounting for more than half of the country's travel.

Differentiation between facilities is of the utmost importance. These parks need reliable attractions with consistent throughput. As they learn the ropes we're seeing more operators understand the value of the premium products.

Editor's note: At the 2016 Asian Attractions Expo, ProSlide Marketing Programs Manager Chelsea Ogilvie shared that one solution the company has available is the use of six-person rafts on slides that previously used four-person rafts. Although not available for every attraction, most slides can accommodate the larger rafts without any engineering adjustments. Similarly, the company's RocketBLAST™, which uses side mounted water jets to propel riders uphill, can handle two-, three-, or four-seat rafts with the same amount of water propulsion, making the ride flexible for different size parks.

Do factors such as population density, family size, or vacation patterns come into play?

Tong: Yes, and at WhiteWater we work with each client to provide them with the attractions mix to support their business objectives. Also considered are local influences including factors such as population, expected attendance, and seasonality.

Bevk: China has the potential to create some of the most remarkable amusement facilities. At ProSlide we are able to take what we learned over the years to guide clients into understanding and developing great waterparks. Parks at the regional level and destinations both benefit from having similar entertainment complexes which may differ in scale and size.

The best parks are built for what we call a 'design day,' which is about 70-80% of the park's busiest day. This ensures optimal flow through attractions and a waterpark that includes the right mix of high-thrill, high-capacity attractions at all points in the year. Seasonality is also important; parks in north or central China may only be open 100 days a year while parks in the South could be open most of it. Understanding the park's location and its seasonality are critical steps in making sure that the park is designed to be the right size.

Tracy: Definitely, the larger the population the more facilities required.

ProSlide provided all of Siam Park's high-capacity attractionsPhoto courtesy of ProSlide





Guests play in the surf waves in front of WhiteWater slides at Lotte World *Photo courtesy of WhiteWater*

Is your R&D department addressing new products or modifications to existing attractions to handle large crowds?

Bevk: The beauty of custom-designed water rides is one of the things we credit for ProSlide's success in this market. Customer needs are continually changing and we're able to anticipate that curve.

Our deep understanding of water ride physics fuels our endless arsenal of shapes and sizes. The compound curve is the fundamental element in our ride technology. It combines arcs with different radiuses for a faster, tighter line, and stronger G-forces. These arcs allow us to mix and match features on a single path and easily transform any feature from a two-person tubing ride into a six-person raft ride in any footprint.

Much like our TORNADO® funnels – available in 18-, 24-, 45- and 60-foot diameters – the same flexibility can be applied to many of our ride categories. The year 2017 will see the introduction of many higher capacity features, combined with great ride performance.

Tracy: Empex Watertoys is constantly developing new watertoys and increasing interactivity for our Splash Parks. Larger play structures with more interactivity, play features, and slides are also required. New themes must be developed to offer a variety between projects as everyone wants to differentiate from the competition.

Tong: Where space is limited, WhiteWater's No Boundaries ropes course attraction adds variety and creates vertical capacity to provide high throughput in a reasonable footprint.

Our AquaPlay Giant RainFortress GRF17 - Queue free "all-in-one" waterparks provide huge, instantaneous capacity and room for the whole family to play together. This is a large scle structure with interactive features, customizable with multiple waterslides.

Tell us more about your presence in China and other Asian markets.

Tracy: China is creating the largest water parks in the world and therefore water playgrounds in these parks are of substantial size to cater to the throughput. Empex Watertoys are currently in many of the waterpark projects in mainland China and also in the parks in planning. Hotels and municipal parks are also adding smaller water playgrounds throughout the country. Our company also has projects in Japan, Taiwan, Korea, and Philippines.

Tong: WhiteWater is proud to service our customers in their time zone and in their language with our local offices that provide business development, project management, and after sales & maintenance services. Our Shanghai office supports our client base of over 100 projects completed throughout Asia and more than 60 projects within China alone (numbers approximate from most recent project list update).

We work with the region's largest developers such as Samsung Everland, Wanda Dalian Group, OCT Group, Chimelong Group, Waterbom, DaeMyung Leisure Industries, Ltd., Happy Magic Water Cube, Lotte World and more, helping them realize their dreams of success in the amusement and waterpark industry.

Bevk: ProSlide has been active in China for over two decades, but the past five years have seen exceptional growth. While

there are many new waterparks on the boards and opening at a very quick rate, differentiation is of the upmost importance. This mirrors the US waterpark boom in the 1980s and '90s and reinforces the value of each waterpark investment dollar.

The Chinese market demand is directly tied to quality and a vision for premium water theme park experiences - they want to be world leaders. We guarantee our product quality by producing our fiberglass entirely in Canada, where we are able to oversee every stage of the manufacturing process. Our APAC Headquarters in Shanghai, China, which opened April 2015, has doubled in both real-estate and staff. Having this hub has allowed us to be more immersed in the success of the region.



Kevin Dazey (dazey200x@yahoo.com) has a mechanical engineering background and works in R&D at a manufacturing company in St. Louis, MO. His passion for amusement parks began early on while growing up in northeast Ohio near Sea World, Geauga Lake, Cedar Point, and Kennywood.





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A zoo for generation Z

Animal enrichment drives design by Stacey Ludlum, PGAV

t is an absolutely thrilling time to be a zoo designer.

In a recent study by PGAV Destinations, 70% of Generation Z respondents agreed that zoos were the best place to learn about animals and wildlife (over classrooms, online, and the great outdoors itself). The popularity of zoos as educational destinations continues to grow, as does their critical role as catalysts and incubators of conservation. As our understanding of animal behavior and needs continues to expand as well, how do we evolve zoo exhibits in parallel to address this changing understanding of fauna and the growing flocks of zoo guests?

Editor's note: Generation Z is the post-Millennial generation, born in the mid-1990s. A CBS News story describes Gen Z as "the most websavvy, app-friendly generation; social media's new class."

As biologists' and zoologists' research practices and abilities continue to innovate and evolve, so does our understanding of animal behavior both in nature and with human interaction. Brand new discoveries in nature are being made every day, such as the discovery of the first amphibious centipede, Scolopendra, reported in National Geographic in June 2016; or how greater vasa parrots use and share pebbles as tools to grind up shells

to consume for calcium, first reported in Biology Letters in December 2015.

However, since we share this planet with our animal compatriots, we continually shape one another's behaviors. As reported last month in The Scientist, the Yao people of Mozambique cooperate with small honeyguide birds to find bee nests. While Koko the western lowland gorilla may be the most famous primate for learning and using more than 1,000 signs of modified American Sign Language, Rocky, an orangutan living at the Indianapolis Zoo, was recently reported in The Independent to be developing the ability to mimic human speech. As we learn more about animal behavior, and those behaviors continue to change, how will zoo habitats concurrently evolve?

The safari model: advantages and limitations

One approach, as zoos continue to evolve into multiple specialized experiences that recognize the unique needs of specific species, is the greater adoption of large, safari-like expanses of land. For example: elephant exhibits that span thousands of acres, where impressive, multi-aged herds would inhabit spaces with no apparent barriers. Matriarchal families might only be reached by golf cart or thematic safari jeep to

see the magnificent creatures in the space they occupy at that time, on that day. Like hoofstock in large paddocks, elephants' lives might be characterized by choice: where they spend time based on climatic conditions, what and when they eat, how they communicate, and how they enrich their lives though interaction with the landscape, water bodies, and problem solving.

Two of the most notable American destinations serving as early adopters of this model are the San Diego Zoo Safari Park (1,800 acres) and the Columbus Zoo & Aquarium's 9,000-acre "The Wilds." Both of those habitats are home to thousands of common, rare, and endangered animals from around the world, including rhinos, giraffes, tigers, gorillas, and many more. Guests often book group tickets in advance to explore this terrain by tram, hot air balloon, open safari jeeps, and even in some cases horseback, all led by safari guides.

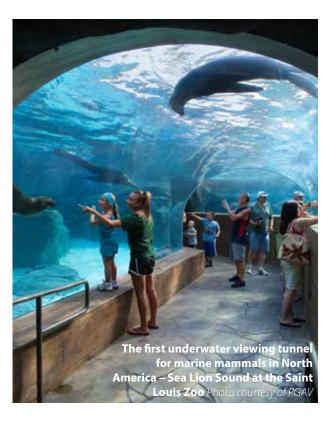
While this may be the best scenario to see the widest variety of animals in a naturalistic environment, it is by no means without its challenges. Guest experiences and education are largely dependent on tour guide narration, weather, and the behavior and availability of the animals on the day of their tour. These large expanses also lead to new challenges in monitoring animal health and behavior, or even illegal trespassing, much like reserves and sanctuaries across the globe. In the US, most zoos are limited, both financially and geographically, in the ability to create these massive preserves. And for guests coming from urban populations, where exposure to nature is often a rare luxury, the ability to travel to these preserves may be quite limited. A safari-like preserve requiring thousands of acres of land is likely far outside of city limits – how might that serve a population that rarely leaves its metro area?

One of the key goals of all AZA-accredited zoos is to inspire conservation action in their guests, with one of the most effective ways to accomplish that being up-close, personal interaction between guest and animal. How do we best accomplish that?

Start with the animal

Understanding the complexities of the animals' behaviors creates opportunities to innovate. When you start with the animal, new ways to approach design become more apparent. To bring guests closer to zoo inhabitants, designers have been innovating with new experiences for years. Sometimes these may take the form of large acrylic tunnels through animal habitats above the guests' heads; or they may be pop-up domes inside prairie dog, penguin, or poison dart frog habitats. At the Louisville Zoo's Glacier Run, there is a cross-over bridge for the resident bears to pass above the guest trail. However, interaction is truly the key to memory and passion.

It is a common misconception that all animals in human care would "prefer" to disconnect from zoo guests. While it's true



that many animal species are extremely elusive, shy, and easily stressed by any novelty in their environment, especially other living beings including the guests, far more animal species find the safe, controlled interaction with guests to be enriching – visibly so. For them, guests offer enrichment, stimulus, variety, interaction. We are unpredictable in our arrival and departure times, in our shapes, sizes, color of clothing, and our demeanors. And perhaps more powerfully, we react to the animals. There have been many instances of animals working to get reactions out of guests. The Mystic Aquarium's resident beluga whale, Juno, is famous for playfully interacting with visitors who approach his enclosure – and even for upstaging performances that take place in front of it. Cacique, one of the star residents of the Bahamas' Dolphin Encounters, became an internet sensation last year when the dolphin dove to the bottom of the Atlantic Ocean to retrieve a Miami Heat cheerleader's dropped cell phone.

These kinds of spontaneous personal interactions are surprising and delightful. They also give clues to natural behaviors that can be further encouraged and facilitated through deliberate design - creating ideal opportunities for positive enrichment on both sides of the enclosure.

Managed interactions

Today's interactions are highly controlled, managed, and messaged by trained keepers, and provide the animals the choice of whether or not to participate. Regulations for dolphin encounters, for example, require a 'sanctuary' space into which



dolphins may retreat if they decide they no longer want to participate. Giraffe feeds occur on a single platform and giraffes decide if they want to participate. Feedings in general occur on a timed schedule and the food is carefully allotted, allocated, recorded, and considered an integral part of the animals' diets. Several innovative exhibits have recently been developed in which enrichment was the driving force behind the design. Glacier Run at Louisville Zoo, Treetop Trails at Philadelphia Zoo, and Heart of Africa at Columbus Zoo each do this in ways that are unique to each specific zoo's operational strategies and enrichment programs. At Busch Gardens Tampa's Jungala, first opened in 2008, guests have the opportunity to play tug-of-war with a tiger through a controlled interaction. This experience gives guests the opportunity to learn the strength and technique of how a tiger practices feeding behaviors, while the tigers get unique experiences and exercise.

As zoo designers, it's essential that we continually gather feedback and insights from not only the scientific world and guest research, but also zookeepers as well. As these staff members interact with animals in human care each day, they are often the absolute best resource for observing patterned, changing behaviors in zoo residents. Recently, PGAV Destinations VP John Kemper and I participated in the Keeper for a Day program at Busch Gardens Tampa. Arriving shortly after dawn, we worked side-by-side with the elephant keepers to transport the elephants off-exhibit, shoveled up their mess from the night before, and then hid food within enrichment opportunities

throughout the habitat. Once the elephants were reintroduced, we had the incredible lesson in observing how they navigated our hidden-food puzzles. Then we were able to repeat the entire process, immediately learning from our observations of the elephants' behaviors. Experiences like this, and communicating with zoo staff on a regular basis, will continually drive innovation in designing zoo habitats to respond to changing animal needs.

Our understanding of the natural world, as well as animals in human care, is rapidly growing as our scientific study abilities improve and our rate of communication accelerates. While support for zoos has never been stronger, guests are demanding more out of these destinations as conservation and educational entities, and designers and zoo managers across the world are eager to meet the challenge. •••



Stacey Ludlum is a Zoological Designer and Site Planner at the award-winning PGAV Destinations, based in St. Louis, MO. She's designed for the world's foremost animal parks, from single bird enclosures to ride-and-habitat integration to entire thematic complexes. Stacey received a B.S. in Zoology in 2000 from Michigan State University, followed by a Master's in Landscape Architecture in 2003 from North

Carolina State University. Read more from Stacey at http://pgavdestinations.com/author/ludzoo/.

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What's AV got to do with animal attractions?

Technology creates new opportunities for immersion and interactivity

by Joe Kleiman

The quest to capture Pokémon in cities big and small, day and night, around the world, has motivated children and adults of all ages to visit and explore new and familiar places. Zoos and aquariums are among the many facilities that have been quick to pick up on the trend and use the Pokémon GO augmented reality (AR) craze to bring more people through the gates.

Without knocking the obvious value of increased attendance, it can be argued that Pokemon GO might distract from core mission and collections – all the more so because of its immersive, interactive power. But imagine AR or other forms of digital media applied to engage and entertain guests with content and an experience complementary to the specific venue - with the zoo or aquarium shaping the message.

In fact, such projects already exist. We look at several new examples: a smartphone app and beacon technology at the

Memphis Zoo, an app that interacts with the show and projection mapping technology at the Ringling Bros Circus, a multimedia voyage to Antarctica at the Detroit Zoo that is integrated with a penguin exhibit. We also preview a new theater and gallery in the making at Aquarium of the Pacific (Long Beach, CA).

Memphis Zoo: Joined at the hippo?

The Memphis Zoo \$29 million Zambezi River Hippo Camp, opened since August, is the zoo's first use of beacons. Beacons are small physical tags, often hidden or inconspicuous within an environment, that communicate to a smartphone or tablet through Bluetooth signal, triggering area-specific content within an app. Beacons animate an environment, making it interactive and responsive in seemingly magical ways, and adding the potential to deliver new levels of information, experience and guest engagement. "We had two different catalysts for including the beacons," says Laura Doty, Marketing and Communications

Manager for the Zoo, "This new exhibit was a long time coming. We wanted to share more information with our quests."

Speak Creative, the Memphis-based internet design company behind the Zoo's website and app, proposed the use of beacon technology. Eight beacons were installed within the Zambezi River Hippo Camp and are currently active. Another 12 at other locations throughout the zoo will be activated soon.

The new exhibit features hippos, Nile crocodiles, flamingos, patas monkeys, and okapi, among other animals. The zoo's app, triggered by the beacons, provides information, including media, to supplement the printed graphics. Doty explains, "We're able to give a more in-depth look at the processes we use with the animals or the animals themselves. One of the things the beacon makes available is a behind-the-scenes video of how we moved them from their old enclosure on the far side of the park. We videoed the entire process of placing them in a crate and moving them by truck. There's similar behind the scenes video with the crocodiles – you see the man in South Africa who raised them."

The beacons provide other benefits. "We can track visitor movement," says Doty. "This led us to add additional signage in one exhibit because we discovered through the beacons and the app that guests were turning around and exiting through

the entrance instead of experiencing the entire exhibit." Another benefit is the ability to change content over time. The Zoo is working with the students of St. George's Independent School to develop new content and interactives for the app.

The app is linked to the Zoo's social media accounts and that will soon include the Twitter accounts for the Zoo's two female hippos, Binti and Splish. "They lend a voice to the animals - it became another way to engage them with the public," says Doty. "Construction delays set back the opening one month – so this built up anticipation. It was very successful and we're in discussion about other animals having Twitter accounts."

Interplanetary projection mapping at Ringling Bros

A smartphone app now plays a key role in one of the world's major circuses.

Feld Entertainment made the decision in 2014 to retire all of its Asian elephants, and has been re-envisioning the Ringling Bros Circus. Patrons of the new show, "Out of This World," are directed to start their experience by downloading the show's app on their devices. The app features augmented reality games (such as taking a selfie in a costume animated by the app), trivia, and surveys. Two large screens flanking either side of the stage display Tweets and other social media posts during the preshow.





Story-driven with fast-paced action, "Out of this World" is not your grandparents' circus. As rubber flooring is no longer needed for elephants, the majority of the stage is now an ice surface – used for skating (nothing new to the Felds, who also run Disney on Ice) – and also as a projection surface. A single performance ring sits atop the ice at the far end of the stage.

Suspended from the ceiling is a 54′x 138′long truss grid, capable of holding up to 118,000 pounds. Among the equipment housed in the grid are seven 4K digital projectors, which utilize the white surface of the ice for a series of projection-mapped sequences designed by Jimmy Lakatos (whose clients also include Cirque du Soleil), and programming by Scottish firm The Hive Creative using d3 projection mapping equipment and software. Projection virtually transports the show "out of this world" to other planets where, as the story goes, various circus acts that had disappeared are now rediscovered. For example, the big cats perform on a desert planet.

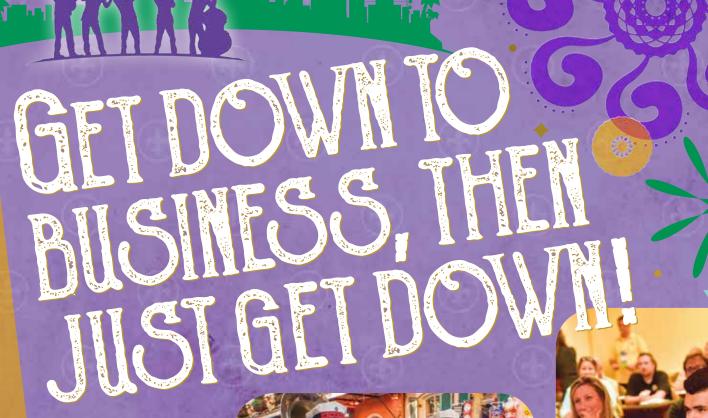
Also in the grid is an automated spotlight system. Each performer wears a stringer, a long cord that runs through their uniform, attached to a battery pack on one end and an infrared emitter on the other. Small cameras in the grid track the emitters and, upon command, initiate a spotlight which automatically follows the signal.

Penguins and projection at the Detroit Zoo

The Detroit Zoo is using multimedia to simulate one of the harshest environments on Earth at the 33,000 square foot Polk Penguin Conservation Center. The Center is not only dedicated to its namesake avian, but presents a multimedia trip through Antarctica.

In the entrance gallery, in a two-story pavilion shaped something like an iceberg (architects were Albert Kahn Associates and Jones & Jones Architecture) visitors view the main penguin exhibit. The pavilion holds about 300 people at a time and timed ticketing modulates the flow. More than 80 birds and four species can be seen through a large acrylic window as they dive and swim in a 326,000 gallon, 25-foot deep pool. A wave machine, with three unique settings, allows the penguins to experience the water as they would in the wild.

The zoo wanted to convey the extremity of the Antarctic environment in two ways: as a home to penguins and a challenge to human explorers. Visitors descend via ramp to the lower level for an immersive, simulated journey through the Drake Passage - the 500-mile-wide stretch of ocean between Chile and Antarctica. Their vessel is Ernest Shackleton's ship The Endurance, which in 1915 became crushed in the ice of the Weddell sea, leading to a precarious trek over the ice and the continent. Miraculously, all crew members survived.







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To design the multimedia Endurance production, the Detroit Zoo engaged SimEx-Iwerks, with which it has a long-term relationship. The show utilizes five short-throw, ceiling mounted 4K laser projectors on five walls at odd angles, along with wind and spray effects to give the effect of being on stormy seas. According to David Needham of SimEx-Iwerks, "The exterior of the building is reflected in the interior where there are no real straight lines. We wanted to be as low impact as possible on the building while creating images that filled the space."

Video monitors seen through portholes display other animals that live beneath Antarctic waters – leopard seals, orcas, humpback whales, and giant squid. Between two acrylic viewing tunnels where penguins swim above and around guests is another large, underwater viewing window that doubles as a screen. Based on its Human-Machine Interface technology, which allows important dashboard information to be projected on a car's windshield, auto manufacturer Denso provided the Zoo with projectors that provide temperature information and facts about the penguins, shining on the acrylic, but appearing to float in the water.

As they ascend another ramp back up to the "surface" visitors are surrounded by more projection, as if they are watching from a ship just off the Antarctic coast as ice drops from a glacier into the ocean. Another view of the penguins is provided through a window in the exit gallery, followed by retail.

Aquarium of the Pacific: the future happens

Projection plays a key role in the design of the new Pacific Visions pavilion at Aquarium of the Pacific in Long Beach, which is scheduled to open in 2018. Its four components are an art gallery, an orientation gallery with media wall, a unique theater presentation, and a post-show gallery with interactive elements and live animals.

According to Fahria Qader, the Aquarium's project manager in charge of the campus master plan, "Pacific Visions is the result of meetings we had in 2005, with input from board members, staff, and designers." The goal is to showcase the oceans in new and dynamic ways.

According to Derek Balsillie, the Aquarium's Senior Manager of AV & IT the art gallery will feature a combination of sculpture and media based artwork, with the collections changing periodically. The idea, according to Qader, is to get people thinking about science through examining art.

Inside the orientation gallery, on a 28'x 8' screen, visitors will be posed questions that are later revisited in the main presentation. Qader says, "Our first story will be about designing the future. We want guests to start thinking about the future and how to get there, to have an active role, to learn and be educated in a fun way, and to start involving others. They'll be able to branch out to others through options like our app."

The theater presentation is the main show. It will run about eight minutes on a $130^{\circ} \times 30^{\circ}$ screen with 130-degree curvature, fed by three 4K projectors. A fourth projector will be under the floor of the theater. Details of AV, 4D effects and interactivity are still being worked out. "The idea," says Qader, "is to give the impression of looking down in the ocean." The theater will also serve as a multi-purpose space for evening events, performing arts, music, lectures, etc.

After the main show will be other multimedia experiences, interactives, and live animal displays. An app will be designed to complement the experience.

As their guide for Pacific Visions, the Aquarium of the Pacific adapted a quote from the American historian and philosopher Will Durant: "The future never just happened. It was created."•••



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This is how Weber ROCKS!

by Carolyn Gaeta McLean, Weber Group



This made me ponder.

What makes a happy rock? For the Museum, Weber's mission was to build an exact replica of this raw and natural cave, including stalactites hanging from the cave's ceiling, for the Museum's upcoming debut of their Scienceworks Exhibit. This interactive exhibit explains how a cave is formed within our ecosystem and Weber's job was to make it look and feel just like the actual Marengo Cave.

A deeper dive into the conversation on the methodology of rockwork ensued. My team, a group who refer to themselves as "The Rockers," gave me a full download on the intricacies of this aspect of our business. And in an effort to remain loyal to my journalism roots, I won't bury the lead. Good rockwork enhances the guest experience at any themed attraction. It transports the guest into an immersive environment as well as distant times in the geological record.

A healthy economy has recently bolstered sales. The uptick has mainly been in four market sectors: zoos, botanical gardens, museums and waterparks. Clients in these spaces rely heavily on a rockwork team's expertise due to the fact it is such a tricky business.

Rockers are skilled professionals. They study real rocks and how they form, and then take those observations and turn concrete into art. And they can simulate any kind of rock out of shotcrete that Mother Nature once formed.



Texture and authenticity

According to Weber rock artist Dan Jennison, the key is having the right mix to achieve cast stone texture. "If you don't have the right mix design it will crack and you won't be able to carve anything substantial. The secret sauce is the right mix design."

Like any secret sauce, every Rocker has their own recipe. Shotcrete provides the structure and is made up of portland cement, fly ash, sand and an array of admixtures for plasticity, waterproofing, integral color, etc. To achieve the right texture, you need enough aggregate, which allows the surface to be shaped and smoothed. Finished rockwork jobs should last nearly three decades without cracking. The end product is a landscape that creates a natural environment or a fantasy that transports guests to another time or dimension.

"When the public can't tell if it's artificial and they have to get up close and touch it to see if it's real, well that's a sign of good rockwork," says Gil Martinez, rockwork artisan. Gil is part of a nomadic group that relishes creating one-of-a-kind, memorable pieces all over the world. Photo op and/or "Wow" status might be another sign of success. Gil and his team at the Weber Group were tasked with creating a larger than life sculpt we refer to as the Spring Giant, at the Tulsa Botanical Garden. The base is concrete and artfully transforms into what appears to be chiseled limestone. This piece de resistance has become a Hero moment for guests taking pictures at the Children's Garden.

"The Spring Giant with his salivating water curtain is the water source for our Stream Valley, so he is located near the back of our Children's Discovery Garden and not visible from the entrance walk, "says Dr. Todd Lasseigne, Tulsa Botanic Garden President and CEO. "When people get to a vantage point to take in the entire view – there is usually a jaw drop or a 'Wow!' followed by amazement as they take in the remarkable details in the work. It is truly a one-of-a-kind piece of art - iconic for our Garden."

A Weber Group artist inspects recently installed rockwork Photo courtesy of Weber Group With any rockwork job, there is typically a set of challenges. For the Spring Giant, crews were working during the summer in brutally hot Tulsa temperatures. Heat affects the shotcrete. If it's too hot, it becomes weak and cracks. The ideal temperature is 60-degrees F (15C) in moderate humidity with a certain amount of moisture

Climate control is key and problem solving is part of the game. On another project, one for Great Wolf Lodge in Fitchburg, MA, Weber Group built a 40-foot tent and brought in portable heaters while sculpting The Great Wolf, a 37-foot-tall statue that greets guests entering the indoor waterpark resort. In that case, the frigid temperatures were freezing the mix too soon.

Paint and discovery

A good rockwork team understands the risk variables and communicates with the client along the way to manage expectations. That includes the final stage of rock working – Paint.

After the last piece of concrete is carved and cured, it's time to paint. Tactical painting will bring the rock to life. These finishes are achieved with a mix of washes; spray techniques; dry brushing and layering. Finally, it is put under a clear coat for protection from visitors, critters and the sun preventing wear and tear. Good paint will give the rock that natural illusion or in some cases a lively, colorful pop which adds to the overall thematic scene. A good end product is usually met with rave reviews and applause.

Themed rockwork elements are an additional draw and extend a guest's total time at a property. Rockwork can also double as a means to hiding unsightly maintenance or ride equipment that can take a guest out of the moment. Zoos do a nice job with this. They hide traditional construction with landscaping or in some cases – rockwork within the animal's habitat. This adds to creating a scene for the guest that feels like an authentic place where the animal lives – such as the jungle. It is a life sustaining environment for the animal that make them feel at home.

Weber Project Manager Richard Antczak says, "Good rockwork becomes part of the discovery for the guest. In a zoo, it helps convey a sense of wonder, a moment of inspiration and the desire to return for another visit. That is the methodology of first-class rockwork."

Yes, a sense of escapism. A feeling of traveling without the travel. That is indeed what makes a happy rock.

Carolyn McLean (carolynmclean@webergroupinc.com) is Director of Communications at Weber Group. She is a veteran of the amusement park industry holding former roles as VP of Corporate Communications for Cedar Fair Entertainment and Director of Communications for Six Flags Kentucky Kingdom.





Dolphins on the go

National Aquarium relocation of dolphins is facility expansion on the greatest of scales

by Joe Kleiman

The June 14 announcement by the National Aquarium (Baltimore) that it plans on constructing a sanctuary for its eight dolphins in the tropics, with a target date of 2020 is a game changer. Although it may serve as verbal ammunition to animal rights activists, it is also an example of a creative way of improving animal welfare in exhibit design and expanding animal care facilities beyond the brick and mortar of traditional zoos and aquariums.

It is important to note that, much like the Ringling Bros. Center for Elephant Conservation located in Florida, what is being called a sanctuary is not a sanctuary in the animal rights sense of the term. Animal sanctuaries typically service two kinds of animals - those that have been abused or neglected and might be in need of rehabilitation, and those that lived in zoos or performed publicly and are past their prime. Neither is the case with the National Aquarium's dolphins.

Although many retired animals are sent to sanctuaries, this move by the National Aquarium should not be considered a retirement. Since 2011, no scheduled choreographed performances have taken place with the Aquarium's eight dolphins, though behavior and training demonstrations do continue daily and will continue at the seaside habitat. Likewise, sanctuary bans on breeding should not be taken into consideration, as the Aquarium took steps to cease dolphin breeding years ago to prevent inbreeding, since the two male dolphins are related to the females in its collection.

In a 2014 conversation I had with National Aquarium CEO John Racanelli, he spoke at length about the options the Aquarium was considering for its dolphins, one of which was the seaside habitat solution. It's best to think of the Aquarium's new tropical dolphin habitat as an exhibit - an expansion of the Aquarium's Baltimore campus, if you will. It will be accessible to guests at

the Aquarium through cutting edge technological innovations to be announced at a later date.

National Aquarium's consideration of a seaside habitat apparently predated both Ringling's decision to retire its elephants and SeaWorld's to end breeding of its killer whales. Comparisons show some important differences. Ringling will continue to breed its elephants in a controlled environment, while SeaWorld has continually resisted placing its whales in what activists call "sea pen sanctuaries," and the courts have been on the company's side. Efforts led by the animal rights group PETA in federal court to release captive killer whales owned by SeaWorld and Parques Reunidos to such sanctuaries have so far failed five out of six times, with the sixth case having been filed within the past month.

Regardless of SeaWorld's success in the courtroom, on August 30 California Governor Jerry Brown signed into law a bill that had been piggybacked on a budget amendment, outlining restrictions on the breeding, display, and transport of captive killer whales within the state. Within California, SeaWorld can no longer reverse the decisions it had already made for its whales without violating the law.

Getting back to National Aquarium - the decision to build the seaside habitat is based as much on boosting attendance and revenue as on improving the dynamics of the dolphins' environment. When the Aquarium switched from scheduled showtimes on an upcharge ticket to general visitation, more people were able to flow through the facility. The slight increase in general admission ticket prices offset the loss from the discontinuation of show tickets. Now, with the dolphins relocating by 2020 off premises, valuable real estate will become available in the Baltimore facility. Whether the tank will be used for rescue and rehabilitation of local marine life or the entire area will be remodeled into a new exhibit remains to be seen.

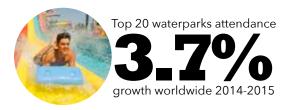
In many ways, the new seaside habitat harkens back to 1972, when the Zoological Society of San Diego opened the San Diego Wild Animal Park (now known as the San Diego Zoo Safari Park), with the concept of allowing its animals to roam in large, naturalistic enclosures rather than reside in the compact cages and exhibits then found within the Zoo grounds at Balboa Park.

As with the San Diego Zoo 44 years ago, the National Aquarium isn't removing its dolphins - it's expanding its facility, its scope, and with it, the guest experience. • • •

Joe Kleiman, InPark News Editor, writes often about animal attractions, zoos and aquariums. His family were among the original shareholders of SeaWorld, and Joe interned in the Aviculture department of SeaWorld San Diego. He later spent two years caring for animals at the San Francisco Zoo. In addition to his work with animals from penguins to rhinos, Joe has more than 20 years' management experience in the attractions and museum sectors.



FACTS& figures from the 2015 TEA/AECOM Theme Index



Water parks are harder to track than theme parks in Asia. They are being built at a faster pace – there might be as many as five water parks being built for every new theme park.

Chris Yoshii, Vice President Asia Pacific, AECOM Beth Chang, Regional Director, Economics, Asia-Pacific, AECOM

Overall, water park attendance numbers in North America were also up significantly in 2015 for the Top 20 facilities – at 4.3%, nearly tripling the growth rate in 2014 numbers – a remarkably strong showing after the past two years' flat to negative numbers.

Brian Sands, Vice President, Economics, The Americas, AECOM



TOP 20 WORLDWIDE WATERPARKS		% change 2014-2015
1. Chimelong Water Park, Guangzhao, China	2,352,000	4.1%
2. Typhoon Lagoon / Walt Disney World, Orlando, Florida	2,294,000	5.0%
3. Blizzard Beach / Walt Disney World, Orlando, Florida	2,107,000	5.0%
4. Bahamas Aquaventure Water Park, Nassau, Bahamas	1,868,000	1.0%
5. Thermas Dos Laranjais, Olimpia, Brazil	1,761,000	-9.2%
6. Aquatica / SeaWorld, Orlando, Florida	1,600.000	2.0%
7. Ocean World, Gangwon-Do, South Korea	1,509,000	-5.9%
8. Caribbean Way, Gyeonggi-Do, South Korea	1,434,000	-4.0%
9. Aquaventure Water Park, Dubai, U.A.E.	1,400,000	0.0%
10. Wet 'n Wild, Orlando, Florida	1,310,000	2.0%
11. Hot Park Rio Quente, Caldas Novas, Brazil	1,288,000	0.0%
12. Therme Erding, Erding, Germany	1,235,000	23.5%
13. Wet 'n' Wild Gold Coast, Gold Coast, Australia	1,200,000	0.0%
14. Shenyang Royal Ocean Park Water World, Fushun, China	1,150,000	-1.9%
15. Tropical Islands, Krausnick, Germany	1,100,000	10%
16. Sunway Lagoon, Kuala Lumpur, Malaysia	1,077,000	-2.1%
17. Schlitterbahn, New Braunfels, Texas	1,037,000	0.0%
18. Aquaplace , Prague, Czech Republic	997,000	18%
19. Atlantis Water Adventure, Jakarta, Indonesia	970,000	1.0%
Beach Park, Aquiraz, Brazil	970,000	2.2%
Piscilago , Girardo (Bogota), Colombia	970,000	-4.7%

The Themed Entertainment Association (TEA) and the economics practice at AECOM collaborate annually to produce the TEA/ AECOM Theme Index & Museum Index, the definitive report on top-attended theme parks, water parks and museums around the world. The report, published every June, studies the prior calendar year.



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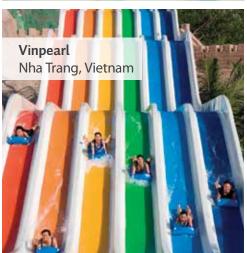
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